The Físchlár Digital Video System: A Digital Library of Broadcast TV Programmes

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ABSTRACT

Físchlár is a system for recording, indexing, browsing and playback of broadcast TV programmes which has been operational on our University campus for almost 18 months. In this paper we give a brief overview of how the system operates, how TV programmes are organised for browse/playback and a short report on the system usage by over 900 users in our University.

1. INTRODUCTION

The Físchlár digital video system is a web-based system for recording, analysis, browsing and playback of TV programmes which is used within the campus environment at Dublin City University. It allows users to initiate the recording of programmes from any of the 8 terrestrial TV stations for our area. Once digitised, programmes are analysed for shot boundaries and shot-based representative frames are selected [1]. Shots are then clustered into scenes using a variety of techniques. Físchlár is accessed through a conventional web browser on a desktop machine although we have developed a WAP interface to allow users to reserve programme recordings through a mobile phone and we developed a version of the browser/player for a PDA in a mobile environment. The Físchlár system is described in [2].

In its current configuration, Físchlár allows users to record, play (stream) and browse programmes, and it is the way we allow browsing of TV programme content which is one of the reasons that Físchlár is novel. Commercially available TV recording devices such as TiVo [3] allow recording and playback of broadcast TV content but the browsing function is little more than fast forward and rewind. In Físchlár we have developed 8 different browser interfaces, described and evaluated elsewhere [4], each of which is tailored to a user's task, context and preferences. For example, there are different keyframe browsers for users depending upon whether they have seen the particular programme being browsed before and are interested in locating a particular scene they know, or they are watching for the first time.

There are browsers for users who prefer linear vs. structured browsing or for users who prefer a static vs. a dynamic interaction style. Altogether this means that there is sound support for a user's specific task and the context for their need.

Another aspect of Físchlár which is novel, and which is of interest here, is that it has been integrated with a large-scale TV recommender system called PTV [5] and in the remainder of this paper we give a brief overview of what that provides and how it is being used.

2. THE COMBINED FÍSCHLÁR-PTV SYSTEM

Físchlár has been in continuous use for almost 18 months and during that time we have developed, refined and enhanced its functionality. Digital video, in MPEG-1 format, is stored on a SUN Enterprise video server and our archive has over 300 hours of TV (about 400 broadcast programmes) content at any one time. Our server is capable of streaming to over 200 clients concurrently via a web browser plug-in and the system is available from student residences, undergraduate and postgraduate laboratories, and from the main library on campus.

All users must register before using Físchlár and through a logging on process, we are able to track usage and offer personalised services. This includes remembering the user's favoured browser interface as well as programmes. Users use the system mostly for entertainment but also for study-related activities such as browsing/playback of news or specialist programmes (broadcast documentaries, etc.).

Físchlár has two modes of operation, one for recording and another for browse/playback. In recording mode, users are presented with TV listings for the 8 major terrestrial TV channels within our area, for today and for tomorrow. We provide, for each programme, some text details on what the programme is about, who it stars etc., taken from an online entertainment guide. Programmes are also automatically assigned to one or more of a dozen genres including sport, documentary, soap, movies, music, kids, home and garden, etc. Users can view the programme listings by TV station, or across the broadcast channels by genre.

Each Físchlár user is also an indirect user of the PTV system. PTV generates recommendations of TV programmes for users to watch based on their past preferences (positive and negative), the past preferences of others who share or have differing preferences, and the descriptions of new, unviewed programmes. PTV uses

case based reasoning as part of its underlying processing and this is described in [5].

A transparent link between Físchlár and PTV allows each Físchlár user's TV viewing recommendations, from PTV, to be presented alongside the TV listings by channel and by genre. In this way we provide not only the standard and genre-organised TV listings for the next 2 days but also a personalised view of what programmes PTV thinks a user should explicitly request recording of. The function of the recording mode in Físchlár is to have the user explicitly select TV programmes which s/he wants to be recorded and to invite the user to grade each programme on a scale of 1 to 5 in terms of their interest in viewing it. These ratings are then passed back to PTV leading to higher quality recommendations. The alternative to having users explicitly request program recording is recording 24/7 on all 8 TV channels but this would allow us to maintain an archive of only the recently broadcast programmes. We feel that users may prefer to access not just materials from within the last week but further back in time, and selective recording rather than taking a shotgun approach, allows us to do just that.

In browse/playback mode, each user is presented with the full library of recorded programmes among which to browse, as well as our within-programme browsing facilities based on keyframe navigation. Recorded programmes (at any one time over 300 hours) can be viewed by TV station, by genre, or by examining recordings from the most recent 7 days only. In addition, we use the connection with PTV to allow personalised recommendations of programmes from the archive to be viewed as well as a category called "favourites", corresponding to subsequent episodes of a user's previous viewings. From a user's perspective this means that when using Físchlár, a user is presented with a TV schedule for the next 2 days from which s/he can request specific programmes to be recorded, with personalised recommendations built in, and a user can browse an archive or library of already broadcast and recorded programmes, again with personalised recommendations built in.

On selecting a specific programme, a user is immediately presented with the set of keyframes drawn from that program which can be a large number of images. For example, a recent 25 minute episode of "The Simpsons" generated 313 keyframes, a 50 minute episode of "Little House on the Prairie" generated 326 and the movie "Crimson Tide", which is 2 hours and 5 minutes, generated 1755 keyframes. Our different browser interfaces described in [4] are used to provide efficient navigation through these keyframes. As a user is browsing the keyframes, he/she can switch to streaming the video of that programme from that keyframe onwards, by clicking the keyframe.

3. USAGE OF THE COMBINED FÍSCHLÁR-PTV SYSTEM

At the time of writing there are over 900 registered users of the Físchlár system. Some of these users are using old PCs in residences, donated by the University to the project and others are using their own desktop machines from within the University intranet. Almost 3000 recording requests have been received in the last 12 months, with 1034 of these requests by 105 users in the last 2 months alone. In fact with our video server limited to storing 300 hours only, we have to remove programmes older than about 1 month in order to provide space for incoming material. The programmes most frequently recorded are "The Simpsons" and "Friends". Other popular programmes are Star Trek (SciFi), Top of the Pops (music), Coronation Street (soap) and 100 years (documentary).

Almost 30% of our users have logged into the system 5 times or more but this statistic is a bit misleading since a single login persists over the whole of a browser's session, so if a user "logs on" to the system then that session remains until the browser application on the PC is shut down. Feedback from users has been hugely positive, especially from those using it in residences. Using the system from labs is less comfortable for users and has been likened to watching TV in public.

In coupling Físchlár with the PTV system we have extended the usefulness of both systems and the combined system presents the user with personalised access to a library of digital video materials. We will shortly introduce other functionality to the system such as text-searching and content-based alerting based on teletext capture. One application which has been requested by staff and students is what we call "buddy clipping", the ability to scope out and define a clip of video from the library whose address can be emailed as an embedded link to others, with text annotation. We have also extended the Físchlár interface to operate on a Compaq iPAQ, a mobile PDA which accesses the system over a wireless LAN.

4. REFERENCES

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